

The PLIGHT *of the* POLLINATOR

Pollinators are in decline in Missouri,
but with a little effort, you can help turn
the tide for these important animals

BY BILL WHITE





Bumblebees are adapted to extract nectar from many native wildflowers, such as this blazing star.

AS A BOY, I KNEW BUMBLEBEES WERE faster than a tractor, and if I didn't want to get stung after disturbing their nest, I needed to jump off the tractor, run like the wind, and not look back. That was the most important thing I knew about pollinators. We had a farm with dairy cattle and lots of hayfields, and that meant we were sure to find a nest or two of bees every summer while mowing, raking, or baling. Since I was in charge of raking hay, I got to jump off the tractor and run often, so my long legs and hair proved beneficial when the bees went for my head. If I had to outrun bees today with my old legs and lack of hair, I would be in deep trouble.

But I wouldn't have to worry about running from a nest of bumblebees on that farm today because they disappeared many years ago. For reasons that are still unclear, we are seeing drastic declines in many pollinators across the country. This is unfortunate since they pollinate 75 percent of all plants producing food for human consumption. In addition, pollinators are vital to creating the habitats that most other animals rely on for food and shelter.

In Missouri, we have at least 450 species of native bees, including several species of bumblebees. There are 4,000 native bee species in North America, and on a worldwide scale, that number swells to between 20 and 30 thousand species of bees. Other animals that provide pollination include various species of birds, bats, flies, beetles, spiders, ants, moths, and butterflies. Native bees are thought to be the most efficient pollinators, even better than honeybees. For instance, a single blueberry bee can visit 50,000 flowers in its short lifetime, resulting in the production of 6,000 blueberries.

How Can We Help Pollinators?

Scientists believe the loss of native bees' habitat may be the key to their decline. They use many of the same habitats as bobwhite quail, rabbits, and grassland songbirds, which are also declining in the Midwest. The proof is in a study being conducted by the Department and the University of Missouri-Bradford Research and Extension Center near Columbia. In 2012, a new native wildflower planting was visited by just one native bumblebee species. In 2014, as the planting matured and more species of wildflowers bloomed, six species of native bees were documented. In 2015, two bumblebee nests were found in the planting.

Fortunately, whether you just have a backyard in the city or hundreds of acres in rural Missouri, you can help



Save the Monarch!

The monarch is an iconic insect species and perhaps the only butterfly that every Missourian knows by name. While the monarch isn't as effective at pollinating as native bees, what makes them unique and worth saving is they are the only insect in North America that migrates across three countries, one of the most spectacular natural phenomena in the world. While its wintering population in Mexico and California has seen long-term declines, the tragic decline in 2012 made national news and started discussions about whether the insect deserved endangered species status. Theories abound about the reason for the decline, but the plants they rely on the most, milkweed, are also in decline.

Starting in September and October, eastern/northeastern populations migrate from southern Canada and the United States to overwintering sites in central Mexico where they arrive around November. They start the return trip in March, arriving back here around July. No individual butterfly completes the entire round trip. Female monarchs lay eggs for the next generation during the northward migration and at least five generations are involved in the annual cycle. The last generation makes the trip south into Mexico and can live up to eight months.

The Association of Missouri Electric Cooperatives and the Conservation Federation of Missouri are teaming up with the Department of Conservation to ask Missourians to save the monarch. The effort is part of a statewide collaboration of agriculture organizations, agribusinesses, state and federal agencies, academia, conservation groups, and more.

You can help monarch populations recover by planting any species of native milkweed we find in Missouri, with particular emphasis on common milkweed, butterfly weed, and swamp milkweed. Do not plant scarlet or tropical milkweed (*Asclepias curassavica*) as this exotic plant is known to increase the transfer of a deadly parasite to monarchs.

Plants that provide nectar to monarchs, especially during their fall migration, are also critical. Fall blooming wildflowers, such as New England aster and eastern blazing star, are recommended. For more information on wildflower plants and seed, visit grownative.org.

Protect existing milkweed plants by not mowing during the growing season. Wait until October if you must mow. Avoid using broad-spectrum herbicides near milkweeds. Grass selective herbicides can be used over milkweeds to deter encroachment of nonnative grasses. Avoid burning from May 15 through mid-October.

For small-plot how-to instructions and sample planting designs, visit short.mdc.mo.gov/ZkF. For information on larger acreage plantings, visit short.mdc.mo.gov/ZJh, short.mdc.mo.gov/Ziz, and short.mdc.mo.gov/ZiK.

Ideal land for planting native wildflowers includes marginal cropland, such as areas next to wooded fence lines, corners of a center pivot irrigation system, or severely eroded areas that struggle to produce a crop each year. Odd idle areas, such as the fenced area around a live-stock pond, are also suggested.

Through state and federal agencies, limited cost-share financial resources are available to private landowners for planting grass and wildflower mixes to benefit monarchs and other pollinators. The U.S. Department of Agriculture (USDA) Farm Service Agency's Conservation Reserve Program offers several suggested plantings for pollinators and wildlife that can be used to benefit monarchs. The USDA Natural Resources Conservation Service also offers limited assistance for monarchs through several of their conservation programs. Contact your local USDA Service Center for additional information on these programs.



European honey bee



Snowberry clearwing moth

Pollinators need a diversity of native flowering plants to survive. Clockwise from the top left: columbine, spiderwort, rough blazing star, and common milkweed.



Red milkweed beetle



Pipevine swallowtail butterfly

pollinators by providing for their habitat needs. Here are a few tips:

- Establish perennial native wildflower gardens with a minimum of 25 species. Pick a mix of species that offer a variety of color and blooms throughout the growing season (April to October). According to research, native plants like grayhead coneflower, golden Alexanders, leadplant, and purple prairie clover are necessary for promoting bee diversity.
- Plant or manage for native flowering shrubs, such as false wild indigo and wild plum.
- Bee nest structures can be made for a number of bee species. See xerces.org and search for bee nest.
- Use native wildflower and shrub plantings to connect habitats, such as hedgerows, riparian areas, and brushy roadsides. Use unproductive areas on farms, such as center pivot irrigation corners and field borders sapped by trees in fence lines, for pollinators.
- Edge feathering, the practice of chopping and dropping trees along hedgerows, can be used to increase the amount of downed dead wood and stumps for mason bees or yellow-faced bees.
- Maintain undisturbed areas of bare ground for miner bees and sweat bees. They make their nests in the ground and need an area free of plant litter to build their nest tunnel.
- Learn to identify and control invasive plants. Invasive species have a negative effect on the entire food chain. Research has shown there are 22 times fewer insects in a hedgerow made up of invasive and nonnative species than a hedgerow made up of native plants.
- Bumblebee nesting sites are typically found in native warm-season bunch grasses, such as little bluestem or prairie dropseed.
- Prescribed burning is useful in maintaining pollinator plantings and controlling some invasive species. Research shows prescribed burning increases bee ground-nesting because it reduces plant litter. To protect bees, burning should be conducted between October and February. No more than one-third of a field should be treated at any one time.
- Leave patches of lawn, field, or edge habitat untouched throughout the entire year. If mowing is necessary, do so with your blade raised to the highest height possible to avoid damaging nests or overwintering queen bumblebees. Some of the smallest bee species will overwinter in the stems of wildflowers and weeds.
- Don't forget to plant and protect pollinators' host plants, such as milkweeds for monarchs or spicebush for spicebush swallowtail butterflies.



Prescribed burning increases bee ground-nesting because it reduces plant litter.

There is room on every lawn and every farm in Missouri to improve habitat for pollinators. We depend on them to pollinate our food. Now they are depending on us to provide their habitat.

To learn more about what you can do to improve pollinators' habitat, visit xerces.org, pollinator.org, fws.gov/pollinators, and kidsgardening.org. ▲

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Establish perennial native wildflower gardens with a minimum of 25 species.



NATIVE PLANT GARDEN: NOPPADOL PAOTHONG; LANDOWNER: DAVID STONNER



Landowner Success Story

Landowners Gail and Tom Rowley of Texas County felt an obligation to do more for wildlife on their small farm. Gail wanted to turn the old hayfields, full of invasive species like spotted knapweed, to something that would benefit pollinators and birds, knowing that providing habitat for pollinators would benefit every form of wildlife on the property.

In 2011, they started to convert a portion of their open fields to native grasses and wildflowers. To their amazement, there was a huge reservoir of help for landowners, including a local native seed dealer and the Department.

"This was a turning point that inspired us to do more," said Gail.

They learned how to improve wildlife diversity on their land by using prescribed fire, encouraging native plants already present, controlling invasive plant species, and planting native wildflowers, grasses, and legumes. The change made a huge difference in the number of pollinators and birds present.

"From the tiny flies that pollinate the native grass flowers to the countless butterflies and bees, we have identified well over 40 species of pollinators here."

Gail stresses that when planting for pollinators, we need "to provide habitat that includes caterpillar host plants, as well as nectar sources. Encouraging pollinators also encourages other beneficial insects, which in turn attack insect pests. It's like inviting a team to help us on the farm!"



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**ON THE COVER: A native sweat bee gathers pollen from a
coreopsis flower. Photograph by Noppadol Paothong**

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